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**MAP 2 -- THE BULGARIAN MILITIA GUARD OF THE FRONTIER COASTS
ON THE BLACK SEA**

Bela - Bela
Nesebar - Nesebur
Burgas - Burgas
Sopopol - Sopopol
Tsarevo - Michurin
Ahtopol - Akhtopol
Sv. Ivan - Sv. Ivan
Turquie - Turkey
Mer Noire - Black Sea

LEGENDE - LEGEND

Zone de Regiment - Regiment zone
Secteur du Bataillon - Battalion sector
Rayon de la Compagnie - Company ~~radius~~
Postes - Posts

Echelle 1:500.000 - Scale 1 to 500,000

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BRAZIL'S IRON-ORE RESOURCES

At a stage of civilization in which the economic factor, which has become increasingly important, furnishing young nations with the credentials with which they can struggle for a place among the great powers, the presence of a robust economy [in a country] is an index of its capacity and merit, by means of which these nations obtain the respect and attention of the rest of the peoples in a conjunction of interests so strong that a place is opened where voices gain authority, thus making possible an influence on the destiny of humanity, for the conquest of a better world. It is, therefore, a live and profitable economy, with creative energy useful to the social community, which is based on the positive value of a people, and grants them not only the means to raise the level of collective culture and to foment progress, but also to adapt its riches to undertakings of a high order, even in the domain of international society under the generous rule of the eternal Christian principles.

Iron-Mining Process

It is never out of place to emphasize that in the rational exploration of the iron-ore beds which it treasures, Brazil will have one of the main stays of its economic structure, to such a degree that it will typify a new cycle of work, expansion, and enrichment, as definite and distinct a cycle as the one which marked the evolution of the country.

Perhaps none of the riches with which Brazil works and progresses may be compared to that of its potential iron capacity and in the active substance of its wealth in iron ore.

Actually, all its other economic activities are subject to the risks, if not, to the real effects, of international competition, whether through natural production, or by recourse to synthetic substitutes, to the point that the exploration of our inexhaustible iron beds finds a vast field for sure development, in a historical phase of the metallurgical industry, in which the reserves of iron abroad are diminishing more and more.

Consequently, the way is opened for Brazilian economy to institute a "cycle of iron" with all its young forces in a vigorous progressive movement, which will take place under the most heartening auspices of complete victory.

Because, today, more than ever, Brazil's iron represents an economic horizon including not only a multiplicity of furnaces in the country, for the melting of the precious and abundant ore, in all forms and types, and for a variety of purposes; not only the progress of the iron industry in heavy industry, of which the admirable and triumphant undertaking at Volta Redonda is a prototype; but also the export of iron ore, for supplying factories abroad, and by way of exchange, the indispensable import of mineral fuel, coal and coke, a decisive element in the progress of the enterprises for industrial utilization of the incomparable reserves of our iron centers. And as a result of these factors, the flourishing of the national iron industry on economic bases, and of various other activities, whether industrial, agricultural, or commercial, leading to unlimited new possibilities of export of manifold products and increase of the consumer capacity of the domestic market, to encourage the general upbuilding of the nation and to strengthen the economic foundation which furnishes the resources of production, as a point of support for the powers of the armed forces, in war operations, an eventuality which no people, however idealistic or peaceful, can fail to consider, if it is to continue in time and space.

Force of Progress

One of the agents capable of promoting this kind of catalyst in the economic order of the country, cooperating to hasten our progress, is the Companhia Vale do Rio Doce, tenacious and laborious in the realization of its very constructive plans, in a fine patriotic effort for a greater Brazil, as will be seen from the notes which we are setting forth below.

If it is not a universal habit, occurring also among other peoples, it is at least the nature of our people, to have the vice of not paying attention only when the giant appears, as an imposing surprise, in the revelation of unavoidable fact, just as the spring, which from a narrow trickle becomes a ravine, and then a small river, and finally a river of powerful waters, gaining name and place on maps.

Thus the Companhia Vale do Rio Doce, whose progressive works we are spotlighting once again in this periodical to present a new aspect of its activities, for the appreciation of the efforts already made and of the courses which they are steering.

If the rich province of Minas, for the exploration of the wealth of its beds of various minerals, invites the Brazilians for extracting activities, the drive for gold which in former times impelled the expeditions in their rush for penetration and dominion inland to scatter villages which became cities, has today been replaced by another form of exploring the earth, in search of treasure of another species, plentiful for mining activities, in the celebrated central "quadrilateral of Minas" to challenge organized and efficient work.

In the lands shown on the diagram [p. 12 of original] the Companhia Vale do Rio Doce placed its magnificent work camp, which was transformed into great industrial installations for the extraction of iron ore by the most modern technical processes, on a scale without precedent. Its boldness speaks highly for the energies of an uncommon organization, since its economic activities extend across more than 600 kilometers along its railway, which is being modernized and perfected from the formidable beds of the Minas plateau to the sea, at Espirito Santo, in search of outlets for the Atlantic seaboard routes of the large commonwealth.

The undertakings of this social organization are of a pattern to merit a continuation of support by the high public authorities and also any others who might be able to lend it sincere and efficacious assistance in whatever form, since to support it is to stimulate it and to help Brazil for the coming days of better days.

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View in Retrospect

In regarding the broad ways in which the enterprises of the iron industry in Brazil are found today, one stops to consider what our forefathers accomplished.

Scarcely ninety years after the discovery of Brazil, the first forge for the making of iron appeared in Santo Amaro, in the district of Sao Paulo.. And in Sao Jose do Ipanema, in the same district, in 1818 the production of pig iron was tried in a pioneer attempt scarcely preceded by that which took place in Minas.

As a result, in 1815, the Chamber of Supply of Aguiar e Sa, which in Europe specialized in information on mineralogy and the metallurgy of iron, installed in the present Marre do Pilar at 25 leagues [25 kilometers] from Tejuco, now called Diamantina, its blast furnace for melting ore, having the distinction of being the first to succeed in manufacturing pig iron in Brazil. This enterprise, in spite of its notable achievements, did not endure later than 1930, when it stopped its activities.

A notable fact concerning the plan conceived by the Chamber of Supply was that it brought about the construction of roads which went from this Minas iron center through the Rio Doce valley and extended to the coast, so as to enable the maritime exportation of iron industry products to be carried out.

In the mining territory of the Ouro Preto e Diamantina region, were the small factories of Mariana, Antonio Pereira, Inflecionado, Cosais, Sta. Barbara, Itahira, Santana dos Ferros, Conceicao e Serro, which were equipped with Italian forges, furnaces, and metal melting pots, perfected by the German technician and geologist Baron von Eschwege, who equipped and kept up these factories. In 1875, the number of them amounted to about 80 with an average yearly production of 2 thousand tons of iron.

The first successful undertaking to produce cast-iron in Minas, was that of the Esperanca plant, installed in 1888, near Itabira, of which the blast furnaces were capable of producing 6 thousand tons of cast iron per day.

The Stockholm Congress

An important international event took place in 1910, which revealed to the world the importance of Brazilian ore deposits; it was the International Congress of Stockholm, whose main proposal consisted in balancing world iron ore wealth.

In 1876 the Ouro Preto Mining School was founded under the direction of the French mineralogist and geologist, the engineer Henri Gorceix. Brazilian youth went to study in that establishment of specialized education which produced numerous technicians such as the engineer Gonzaga de Campos, who was charged by the government of Brazil with prospecting for and surveying the existing iron deposits and furnishing data to be presented at the 19th CONGRESS.

Through the work done by Gonzaga de Campos and presented to this Congress by Professor Orville Derby, Head of our Geographical Service, the interested nations learned that, in the central zone of Minas, the potential iron reserves, on the ground level, with an average iron content amounting to 50 to 60 percent iron, were estimated at 5,700,000,000 tons, which did not include underground reserves, which could only be determined by means of drillings and galleries.

At that time, foreign companies turned towards the acquisition of Brazil's richest deposits of iron, so much so that, during the period between 1910 and 1920, some mines were purchased directly from their Brazilian owners, at ridiculous prices, like these famous mines of Itabira which today are a part of the property of the Vale do Rio Doce Company, which were acquired by Great Britain, at the ridiculous price of 800,000 cruzadoes.

Before carrying out such purchases, however, these interested went to the Directors of the Vitoria to Minas Railroad and succeeded in obtaining the majority of the shares, by means of which they obtained control of this enterprise.

It was only afterwards that they obtained the Diamantina to Itabira Railroad and organized their enterprise, called the Itabira Iron Ore Company (or the British Itabira Company in Great Britain) which was authorized to operate in 1911.

High Point in 1939

By the contract signed with the Government of Brazil on 29 May 1920, the Itabira Iron Ore Company, Limited, agreed to export iron on a large scale and to construct, at the same time, iron works capable of producing 150,000 tons of iron and steel.

Due to an uproar on the part of the press and Congress against this contract, and to the vigorous opposition by the Government of Minas to the monopoly of railroad transport and exportation, it was not carried out, and in 1939, was declared null and void by decree number 1,507 of 11 August.

In 1939, financed with Brazilian, Belgian and Luxembourg capital, the Companhia Siderurgica Belgo Mineira was formed, capable of producing 150,000 tons of rolled steel, rails, rolled iron, barbed wire, and galvanized pipes.

In that year, the National Ironworks included 11 blast furnaces, with a total production of 100,000 tons of cast iron and 60,000 of steel, ten of which are in Minas, located in Bannier, Esperanca, Gorceix, Cete, Morro Grande, Sabara, Monlevade, Rio Acima, Belo Horizonte, and Gage, and one in the State of Rio, in Barra Mansa. All of these blast furnaces resulted from private initiative and capital.

Up until 1939, small ore shipments were handled by the Central Railroad of Brazil for exportation. This ore went from the iron mines located near

the railroad line, that is to say, Paracambi and Rio das Velhas, whose export volume, through the port of Rio de Janeiro, amounted to 396,938 tons for 1939, which was imported mainly by Germany (151,613 tons) and the Free City of Danzig (137,665 tons).

As far as exportation was concerned, the mines of the Vale do Rio Doce were still not exploited.

In the history of Brazilian ironworks, 1939 marked the beginning of a new phase, in which the undertakings of a mixed economy, or one financed with both private and state capital, was adopted.

Keeping in mind the development of the great ironworks and promoting the exportation of iron ore on a large scale and at the same time keeping both of these economic activities independent of each other, Brazil attempted to solve the problem through the Technical Council of Economy and Finance, which defined the new orientation to be followed in the following terms:

a) The National Iron Industry, with the establishment of a 200,000 ton plant not in Minas, but in Santa Catarina, Parana or Rio de Janeiro, where there is abundant ore, Brazilian coke and fluxes thus permitting cheaper products in the most important centers of consumption.

b) The exportation of iron ore on a large scale, by the Vale do Rio Doce.

With the object of executing the above two plans, the Government began by nationalizing the deposits and the iron industry, planning the constitution of two companies of mixed economy Jointly owned by Government and private interests, of which the National Treasury was to be the most important stockholder, it being the duty of the one to promote the exportation of iron ore of the Vale do Rio Doce, and the other to establish the great ironworks in the State of Minas.

According to this preliminary of March, 1939, the Executive Commission of the National Iron Industry Plan was appointed to carry out the final studies relative to the construction of an ironworks plant and the creation

of a corporation with the object of constructing and exploiting this plant.

The choice of the locale occasioned lively debates, which drew public attention, but the Commission chose Volta Redonda. Decree number 3,002 of 30 November 1941 authorized the establishment of the National Ironworks Company, establishing that the plant to be constructed would be located at that location in the State of Rio de Janeiro and would have a capacity of 335,000 tons of rails, bars, plates and sheets, bringing the cost of the plant to 3,400,000,000 cruzeiros as follows:

Incorporated capital	1,250,000,000.00
Profit shares	1,240,000,000.00
US loan amounting to 45 million dollars	900,000,000.00
Total	3,400,000,000.00

As indicated by the fortunate success of the exploitation of the Volta Redonda plant, 1948 statistics show that the fiscal year ended with a balance which permitted [the Company] to declare a 6 percent dividend. The production of that year totalled 666,038 tons, as follows (in tons):

Cast iron	224,025
Steel ingots	243,736
rolled (metal)	198,277
Total	666,038

~~THE WASHINGTON AGREEMENT~~

Washington Agreement

The outburst of war in 1939, which immediately involved Great Britain, created, in a short time, serious problems concerning supplying her industry with war material, because iron ore from Sweden did not arrive, as Sweden was practically isolated at the time. Nor did the ore from Norway, which had been invaded, nor did the iron ore from North Africa, already excluded from Great Britain's control, nor that from Spain, whose political regime was of a pattern to provoke distrust.

In 1941, the US was dragged into the conflict, in which all the weight of her weapons and her production played an important part.

Possessing important deposits of iron ore, Brazil was the center of attention of the two countries. At the appeal for help from Great Britain, the Brazilian government decided to examine the conditions of the problem.

At that time, the following factors were evident:

1. The Itabira iron mines, with ore containing from 68 to 70 percent iron, were the property of subjects of the British government and were 36 kilometers distant from the Terminal point of the Vitoria to Minas Railroad.

2. The Vitoria to Minas Railroad belonged to a private enterprise and was in the most precarious condition as far as the upkeep of the permanent road was concerned, due to a lack of adequate equipment, rolling stock, and locomotives, and consequently, did not offer any guarantee for transporting ore on a large scale.

3. The Port of Vitoria, from which the ore would be exported, had been granted to the State of Espirito Santo and was not yet prepared to export ore with the desired speed.

From this difficult situation arose the Washington Agreement, dated 3 May 1942, which permitted Brazil to take the necessary steps for coordination, production, transport, and exportation of her iron ore.

VALE DO RIO DOCE COMPANY

The Government of Brazil issued decree number 4,352, of 1 June 1942, from which resulted the breaking up of the Vitoria to Minas Railroad and the constitution of the Company of mixed economy Jointly owned by government and private interests Vale do Rio doce Company, with capital amounting to 200,000,000 cruzeiros, having as its purpose the extension of that railroad as far as Itabira, as well as reconstructing and refitting, so that it can be depended on to transport a minimum capacity of 1,500,000 tons of iron ore

per year; the improving of the port of Vitoria, completing and improving the ore dock installations of this port; the exploitation, transport, and export of the iron ore of the Itabira mines; the exploitation of the Vitoria to Minas Railroad; and the exploitation and development of the Rio Doce Valley. These projects were planned, by agreement, between the States of Minas and Espirito Santo, and approved by the President of the Republic. A fund will be created for these projects from the net profits of the Company, after the distribution of 15 percent in dividends.

Consequently, the construction and exploitation of plants and ironworks for the manufacture and processing of cast iron, iron, steel, and their derivatives is not a part of their program.

Another result of the Washington Agreement was that the Board of Directors of the Company consisted of 5 members, the President, two Brazilian Directors and two US Directors.

The President has both the vote and the veto right and is chosen freely by the President of the Republic. As for the four Directors, they are elected by the General assembly of stock-holders. It is the duty of the Export-Import Bank of Washington to choose the two US Directors, but since the Brazilian government possesses more than 50 percent of the stocks, it is Brazil in practice which elects them.

The British government acquired iron ore deposits in Itabira from the British Itabira Company and transferred them free of charge and free from any claims on the part of the owners or of royalty holders of British nationality, to the government of Brazil, as well as the following property that belongs to that municipality: Santana, Casa, Conceicao, Rio do Peixe, Bendouro, Oca de Jose Hilario, Dais Correfos, Itabirassui, Jose Coelho, Barrachudos, Campestre e Carrage de Mato, all of this constituting an area of nearly 7,500,000 square meters [sic], valued, in 1942, at 100,000,000 cruzadoes and incorporated in the property of the Vale do Rio Doce Company.

The American government, interested in obtaining ore with a high iron content, is also interested in helping the development of Brazil, encouraging commercial relations between the two countries, and it granted, with the Export-Import Bank of Washington as intermediary, credit amounting to 14,000,000 dollars for the following purchases, in the US:

- a) of machinery and equipment, including crushing and sifting installations which are essential so that the mines can keep up a minimum production capacity amounting to 1,500,000 tons of iron ore per year;
- b) Equipment, materials, machinery, rolling stock, and necessary services for extending and refitting of the Vitoria to Minas Railroad;
- c) Machinery and equipment necessary for increasing and completing the ore-loading facilities of the port of Vitoria.

They are to have absolute priority in supplying it and equipping it and the required materials, because already in 1943, rails, locomotives, railroad cars, machinery, equipment, and materials of all types arrived in Brazilian ports.

The conditions of the loan are truly advantageous to the Company: no guarantee of the National Treasury was required, the liquidation of the interests on the capital will be made only on the quantities resulting from the application of the tax, amounting to 15 percent on the price of each ton of ore exported and 2 cruzeiros per ton of ore transported by the Vitoria to Minas Railroad.

Two promissory notes on the principal were issued, one for 10,000,000 dollars and the other for 4,000,000 dollars, due 25 years from the time they were issued; and 25 promissory notes (on the interest) each one of which is due annually.

Capital Investments

The initial incorporated capital of the Company amounted to 200,000,000 cruzeiros, of which 110,000,000 is in registered common shares of 1,000,000 cruzeiros each, and 90,000,000 in registered preferred shares

of an equal value, 6 percent interest due, subscribed to and executed as follows:

Federal Government	110,000,000.00
Private Companies	32,819,000.00
Public	57,181,000.00

Total	200,000,000.00
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The National Treasury subscribed to 110,000,000 of which 80,000,000 was given in payment to the Vitoria to Minas Railroad.

Thus, the available cash, coming from this initial capital, to be received from the shareholders, in marginal notes, was decreased by 120,000,000.

Afterwards, the federal government decided that the Company must pay to Percival Farquhar, in cash, the sum of 14,000,000 cruzeiros as compensation for the expenses that occurred to him since 1919 in studying the exploration of the iron ore deposits of Itabira, and by the rights of option to which he has the right.

As is seen, the capital for the works was reduced by 94,000,000 cruzeiros, being reduced to 106,000,000, subject to the option of marginal notes of the stockholders, who are never punctual in their payments.

Thus, it would be impossible to carry out the mechanized equipping of the Itabira mines, the reconstruction and equipping of 600 kilometers of railroad, and the construction of the ore wharf of the port of Vitoria.

In addition, it was anticipated that the time required for the termination of these works was two years.

Since the amount of registered capital and of the US loan of 14,000,000 dollars, were insufficient, the Company solicited in 1944 an increase in its capital, for 100,000,000 cruzeiros more in preferred shares of 1,000,000 each, distributed as follows:

Federal Government	83,660,000.00
Private Companies	3,000,000.00
Public	13,340,000.00
Total	100,000,000.00

In 1944, the Company obtained a loan of 300,000,000 cruzeiros, for debentures, in groups of 100,000,000 at 7 percent per year interest, issued at 12 month intervals.

The National Treasury was authorized to subscribe to 60 percent of the total of the debentures.

In 1945, the Company obtained a second loan from the Export-Import Bank of Washington amounting to 5,000,000 dollars which was guaranteed by the National Treasury [This loan was made] under different conditions than the first, its payment having to be made completely in cash.

Law number 24,920 of 7 May 1948 authorized the Company to raise the capital by 650,000,000 cruzeiros, by issuing 350,000,000 more in common registered stocks valued at 1,000,000 each, all of which were subscribed to by the National Treasury

The same law authorized the Ministry of Finance to give the Ministry of Finance to give the guarantees of the National Treasury to a loan of 7,500,000 dollars to be contracted by the Company in the Export-Import Bank of Washington, at an interest rate of $3\frac{1}{2}$ (3.5) percent per year.

This is, roughly, a summary of the financial situation of the Company.

It must be pointed out that, in the middle of 1946, before, consequently, the third US loan, William Martin, President of the Export-Import Bank of Washington, was in Brazil, after making a careful visit of all of the installations of the Company, including the port of Vitoria, the constructions for the improvement of the Vitoria to Minas Railroad, and the Itabira mines, thus verifying, personally, the great possibilities of the Company and learning how the resources of the two loans, which total 19,000,000 dollars were used, he formed an opinion, by which the enterprise earned still more help from the Bank, so as to enable it to reach its goals.

Freedom to Negotiate.

As a result of the Washington Agreement, both the British and US governments agreed to purchase a maximum [sic] of 750,000 tons of iron ore per year, at 100 cruzeiros per ton (1.016 kilograms) FOB shipment delivered in Vitoria, during a period of three years, with the right to renew the contract.

In 1945, hostilities ended, just when the first period ended.

Under these circumstances, Great Britain and the US communicated to the Government of Brazil that they were renouncing their right to make new contracts and thus the enterprise became entirely free to sell its ore to whatever country and at whatever price it considered convenient.

Ore Exports

With the data on hand, we see that all of the ore exported by the Vale do Rio Doce Company, during the period of 1942 to 1945 amounted to a total of 321,903 tons which was sent to Great Britain.

In 1946, exports of ore were at a minimum, 40,962 metric tons to Belgium, the Netherlands, and Canada.

In 1947, exports increased to 174,200 tons, the US being, for the first time, among the importing countries.

In 1948, ore exports by the Company, reached even larger proportions, amounting to 385,252 tons, with a net profit of 47,246,562.20 cruzeiros, representing for Brazil currency [DEVISAS] valued at more than 2,500,000 dollars and a profit of 9,030,334.10 cruzeiros for the enterprise.

The distribution of the exported ore in 1942 was as follows by countries (in tons):

US	227,397
Canada	84,943
Netherlands	44,862
Belgium	28,050
Total	385,252

The following represents ore movements of the Company, in 1948, compared with that of 1947:

Ore extracted from the mines -- 438,812 tons -- 128 percent more.

Ore transported by the Vitoria to Minas Railroad -- 392,763 tons -- 131 percent more. Ore exported -- 385,252 tons -- 121 percent more.

Both ore extraction and ore exports are continuing to increase.

The Vale do Rio Doce Company is doing everything possible either to export a high quality product, which is continuously gaining a better reputation in the centers of consumption or to conscientiously carry out contracted obligations, mainly concerning delivery terms. Thanks to this orientation of work, Itabira ore and the name of the enterprise is continuing to gain ~~higher and higher esteem~~ higher and higher esteem, together with the great ironworks.

The production of the mines in 1948, compared with that of 1947, was as follows (in tons):

	1947	1948	
Ore extracted	177,535	417,679	240,043 more
Slag (matrix)	10,154	10,403	649 more
Total	187,790	428,482	240,692 more

Of the 1948 production, 10,403 tons were consumed by National factories and 32,427 tons remained in stock.

The increase in production for 1948 has as one of its factors the supplementary works, which were carried out in the mines, and other improvements introduced in the local, of which the following deserve mention: Power line to Camo Peak; 6 inch (") compressed air line to the mine head and various 3 inch and 4 inch (") distributing lines; excavation of 6,000 cubic meters near the Compressor House; excavation of the California area; installation of a scale to weigh cars, in the yard of the Itabira station; and the following installations: machine shop, viaduct over the railroad, chute for loading the cars, Compressor House and North substation, drill shop, Pump house, and 4 inch (") water pipe at Esplanada at bench mark 1,100 and a pump installation.

Vitoria-Minas Railroad

When, in 1942, the Vale do Rio Doce Company was reorganized, the Vitoria to Minas Railroad was incorporated within it. The Railroad was at that time in precarious condition. As an element of industrial exploitation, it did not offer any assurance of an intensive exportation of ore, the permanent road, with old and worn out rails weighing only 22 to 25 kilograms [per meter], rested on a roadbed of earth. The rate of breakdown for the rails was very high, and there were not many locomotives. The rolling stock, which was in bad need of repairs, was, for the most part, in the shuntings (switchings) of Almorez, waiting for repairs in the modest car shop.

In that critical war period, the international agreements of the Vale do Rio Doce Company, in spite of the precarious conditions of that railroad, appealed to large powers to increase the transport of ore for exportation.

Only one course could be taken, and that was to strengthen the old existing line, replacing, for long distances, the old rails with new ones weighing 35 kilograms per meter, paving the roadbed in the proper places; installing telegraph posts and sidetracks, both to increase the capacity of the line and ease the crossing of the trains; carrying out many other works as required by the necessity for improving traffic.

In connection with these requirements, 353 kilometers of railroad line were replaced; machinery was imported either for equipping and modernizing the Jose Meiva Shop, where the capacity for repairing locomotives went from 2 to 8 per month; or for the installation of a shop for repairing cars in Itaciba, with a capacity of 30 cars per month. The purchase of 27 Mikado locomotives, 4 locomotives from the Paulista Railroad, 2 Diesel-electric locomotives for shunting (handling) the trains, 350 special steel

cars for transporting ore, 225 flatcars and 298 closedcars was soon arranged.

These were two emergency measures taken to aid the Vale do Rio Doce Company which, from that time on devoted its efforts to the work of modernizing and reequipping the Vitoria to Minas railroad, so as to enable it to take care of ore shipments planned at 1,500,000 tons of ore per year.

Starting from the port of Vitoria, capital of Espirito Santo, the Vitoria to Minas Railroad heads towards the Rio Doce Valley, reaching this river [Rio Doce] at the Barbados station, after covering a distance of 146 kilometers, constructed with a maximum grade (slope) of 2.59 percent and with curves of 100 meter radius.

In order to replace the first section from Vitoria to Colatina, which was 154 kilometers long, an entirely new section 128.539 kilometers long, with curve of minimum radius of 200 meters and a maximum grade of .5 percent in the direction of exportation was planned and constructed. This new section represents a shortening of this part of the RR by 25.5 kilometers.

The second section, between Colatina and Aimores was improved as follows: 53 kilometers long, curve with minimum radius of 100 meters, maximum slope in the direction of exportation of 2.47 percent. Various technical changes were made to enable the Mikado locomotives to pull trains with 1,500 gross tons, as compared with 250 tons which was the capacity of the old line.

The third section, from Aimores to Governador Valadares, 148 kilometers long was originally had curves with 100 meter minimum radius and a maximum grade in the direction of exportation of 1.81 percent, was reconstructed within the third section, one of 7 kilometers and the other of 10.5 kilometers, between Cipin and Governador Valadares.

An important bridge was constructed over the Doce River at 347 kilometers. The metal bridge, resting on pillars of reinforced concrete, is 340 meters long (total length), having seven 40 meter spans and two 80 meter spans.

The fourth section, between Governador Valadares and Ana Matos, which is with a minimum radius of 100 meters and a maximum grade of 1.07 percent in the direction of exportation, was altered to have curves with minimum radius of 200 meters and maximum grade of 5 percent [sic] in the direction of exportation.

The fifth section, between Ana Matos and Campestre, in Itabira, today called Presidente Vargas, is 98 kilometers long and curves with minimum grade (slope) amounting to .60 percent, in the direction of exportation. Important works were carried out to reduce the length to 87 kilometers, one of which the completion of the Desembargador Drumond to Presidente Vargas branch. When the Company was established, the end of the track was located 22 kilometers from Campestre.

The revision of the old route of the Vitoria to Minas Railroad to admit technical conditions compatible with the volume of traffic anticipated for a minimum annual transport of 1,500,000 tons, beyond the browing volume of imported and exported goods by the vast and future region of the Vale do Rio Doce, involves the use of capital to the amount of approximately 600,000,000 cruzeiros, for 600 kilometers approximately, which amounts to an average of 1,000,000 cruzeiros per kilometer.

Traffic operations in 1948

The balance of the traffic exploitation amounted to 2,079,044.00 cruzeiros for the 1948 fiscal year, as follows:

Receipts	70,596,932.50 cruzeiros
Expense	68,517,888.50 "
Balance	2,079,044.00 "

The final balance of the railroad, however, was reduced to 1,160,325.90 cruzeiros as a consequence of the negative result of 898,718.10 cruzeiros on the expense accounts.

From 1942, when the Vale do Rio Doce Company was established, until 1948, the financial picture of the Vitoria to Minas Railroad shows the following movement: (See Table I)

In relation to 1947, receipts increased by 20.5 percent, influenced by the grave effects of a great number of promotions and of a general increase in salaries.

Receipts were affected by both the exceptional rainfall which occurred in November and December of 1948 and two strikes.

In spite of this, the increase in expenses was not more than that of receipts.

The volume of profitable transport increased in 1948. It amounted to 839,539 tons, as compared with 514,400 tons in 1947, a difference of 325,139 tons.

Motor vehicular traffic covered 23,867,863 kilometers, as compared with 15,872,250 for 1947. Train traffic covered 1,906,108 kilometers as compared with 1,459,841 for 1947.

Such figures demonstrate that, for an increase in transported tonnage of approximately 63.2 percent, the increase in expenses was, as already seen, scarcely 20.5 percent. The same for an increase amounting to 63.2 percent of profitable tons transported, the increase in the number of kilometers covered by motor vehicular traffic amounted to 50.4 percent and that covered by trains was scarcely 30.6 percent.

Conclusion to be drawn is that in 1948, the capacity of the motor vehicles and the hauling force of the locomotives was greatly improved.

Still another thing to consider is that the 1948 results are due very much to the utilization of the modernized sections of the Vitoria to Minas railroad.

This volume of transport included the following goods:

	1948	1947
Ore (tons)	392,763	169,483
Timber (tons)	160,409	131,900
(Vegetal Coal (cubic meters)	157,907	166,740
Cereals (sacks)	535,167	250,660
Coffee (sacks)	465,079	546,450

From that can be seen the great increases in volumes of goods, with the exception of coffee for which the difference is due mainly to competition. As far as coal is concerned, the decrease is due to the strikes and the rainfalls.

Works in 1948

Struggling with the difficulties resulting from the deficiency of financial resources, the Vitoria to Minas Railroad carried out the following works in 1948: laying of the new line, to a length of 32 kilometers, in the section Colatina-Aimorés; levelling and laying of the variant line between the 164 and 170 ~~infrastructure~~ kilometer mark; paving of the new line, to a total length of 38 kilometers, from the 154 kilometer mark, to the 179 kilometer mark and from the 189 kilometer (mark) to the 201 kilometer (mark); replacing 133 kilometers of 22.5 kilogram [per meter] rails with 35 kilogram [per meter] rails, between Aimorés and Derrubadina, which was

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necessary because of the excessive wearing out of the old rails; construction of 60 kilometers of fences; levelling of the future Pedro Epitacio station yard in Vitoria; establishing of supplementary ore dump in Itaciba, with a surface area of 85,400 square meters and for the construction of which 42,506 square meters [sic] of earth were excavated.

As for the buildings, one station, one agent house, and 6 buildings were constructed.

The work of uniting Belo Horizonte with Presidente Vargas (formerly Itabira) has already begun. Presidente Vargas is the terminal point of the Vitoria to Minas Railroad. The connection will require an extension of 130 kilometers, having a maximum compensated grade of 1 percent and a minimum curve radius of 312,58 meters.

This connection will establish a new outlet for iron ore from the region of Belo Horizonte, and, once the section is completed and joined to the Vitoria to Minas Railroad, the mining capital will be directly connected to the Rio Doce zone and to the port of Vitoria, without transshipment and without change in the tariffs, by a railroad that is being totally remodeled. Thus the distance between Belo Horizonte-Itabira-Vitoria will be 703 kilometers, along which the future tariffs will be the lowest in Brazil, thanks to the characteristics of strongly built permanent tracks, equipment of its rolling stock and locomotives, which will permit heavy traffic.

Port of Vitoria.

The State of Espirito Santo, which has the port of Vitoria under concession, planned works, in 1940 for the exportation of 500,000 tons of iron ore per year.

The Vale do Rio Doce Company assumed the responsibility of financing the 2d-10, so that the latter can complete the works of the Ore Wharf, thus enabling the port to export annually 1,500,000 tons of ore, which can be increased to 3,000,000 tons. The wharf is to accommodate ships of 33 feet draught instead of 28 feet draught as originally planned. Four mechanical transporters for handling 100 ton loads on the wharf instead of the original 18 tons, thus necessitating enlargement of the platform by 21 meters.15 so as to have room for 4 railroad tracks and a electric crane line for electric cranes. The dredging of the entire approach canal and the evolutional basin to a depth of at least 11 meters for the entering and evolution of ships of 35 feet draught is to be done. Special installations for the unloading and storing of coal cokes, and other heavy yard goods are to be set up as well as ~~machines and~~ ~~installations~~ ~~for~~ ~~the~~ ~~handling~~ ~~of~~ ~~explosives~~ dumps for inflammable goods and explosives.

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The Vale do Rio-Jane Company will lend the sum of 50,000,000 cruzeiros to the State of Espirito Santo for the latter to construct the installations of the Ore Wharf, which is its property, as concessionary of the port.

The Company will be compensated by the State with the tax on the storing of ore on this wharf and others, which is being credited to the State in the account which the latter has with the company.

The works for the improvement of the Ore Wharf are practically completed as far as present needs are concerned, in 1948, two more extensions and three underwater foundations with a volume of 267,400 cubic meters of concrete were constructed. In order to put to better use the capacity of the ore silo (pit) an installation for filling it mechanically with ore was installed over it.

Ship movement for the ORE Wharf, was as follows from 1943 to 1948:

1943	9 ships
1944	16 ships
1945	13 ships
1946	6 ships
1947	17 ships
1948	45 ships

Total exportation for the port of Vitoria in 1948 was as follows (in tons):

Iron ore	385,252	66 percent
Other goods	193,734	34 "
Total	578,986	100 "

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The ore shipping conditions in Vitoria have improved considerably. The time spent to load a ship with 9,500 tons at the Commercial Wharf was from eight to ten days, at an expense, for loading and taxes, of 18/50 cruzeiros per ton. At present, at the Ore Wharf constructed by the Company, this time has been reduced to a day and a half, or 36 hours, at an expense of 8.00 cruzeiros per ton including loading and taxes. When the extension of the wharf is complete, the third transporter installed, the time will be reduced by another 10 hours.

Social service

The Vale do Rio Doce Company is also connected in an appreciable manner, with the social movement that is developing throughout the country. It is lending help to the workers, awakening in them a spirit of solidarity and raising the production level so as to improve living conditions.

Since the start of its organization, the Company has devoted special attention to social and medical aid of its laborers and office workers.

Itabira is an old city to which should flow a large number of laborers, office workers and engineers. Itabira was not prepared to receive them, not only because there were not enough accommodations, but also because the city did not have adequate water, sewer, and hospitalization services.

Because of a complete lack of houses, the Company immediately made arrangements for the construction of residences for the laborers of the mines, for skilled workers, for office workers, for engineers and for service chiefs. These houses were equipped with water, sewers, sanitary installations, cesspools, and electric lights.

At the same time, an emergency hospital and a laboratory were installed.

There are schools for the children of the laborers which are maintained by the company, as well as a Supply Service, for selling commodities, at moderate prices and on credit.

Along the Railroad line, this same aid has been distributed to the laborers and office workers. Wherever Malaria abounds, the Medical Service of the Company gives preventative aid and treatment, supplying free medical care.

In the Rio Doce Valley, the Special Service of Public Health (SESP), in agreement with the contract between the US and Brazilian governments, is providing helpful services for the hygiene of the entire region, either in fighting malaria, or in the hygiene of the cities, supplying them with water and sewers, as in the cities of Fundao, Colatina, Aimores and Governador Valadares.

Thanks to these hygiene methods, there has not been any widespread epidemic of malaria within the past few years.

Looking ahead

Until now, the present summary has been devoted to the past and present aspects, but there is a new chapter of the future of the Vale do Rio Doce Company to be presented dealing with the problems to be studied and solved.

Before, however, we would like to give some facts concerning the financial situation of the Company, or how it is spending the capital which has been confided to it.

The general balance of the Company for the fiscal year 1948 amounted to a profit of 4,214,529,40 cruzeiros. The first verification of this occurred when the enterprise started its operations, which permitted the

Company's losses to decrease from \$1,349,242.60 cruzeiros to 27,134,630.20.

This fact is really encouraging and enables one to anticipate its repetition in the subsequent fiscal years, since the improvements that were introduced in all branches of the Company are aimed at better efficiency in its various industrial and economical operations.

The balance shows that the fixed assets of the Company have increased to 1,125,256,610.00 cruzeiros as compared with 953,753,947.40 for 1947, which is an increase of 171,502,663.60 cruzeiros.

The following table gives an idea of the development of social assets (in cruzeiros):

1943	103,785,416.10
1944	555,934,869.50
1945	769,903,658.00
1946	875,704,413.60
1947	953,753,947.40
1948	1,125,256,610.10

NEW EXPORTATION POLICY

The President of the Vale do Rio Doce Company, the civil and mining engineer, Dr Dermeval Jose Pimenta, who, in addition to being a technician and efficient administrator, has been the director of the enterprise since 1946. He has made numerous speeches and has written numerous excellent articles.

The following has been taken from a lecture that he made recently in Belo Horizonte entitled "New policy of iron ore exportation— estimation of the reserves: "

"All of the iron ore estimations that have been made up until now by Brazilian geologists have been drawn up from simple estimates based on a superficial examination of the ore in the pits.

"The most recent estimation of Brazil's iron ore reserves are based on data obtained from all of the iron ore pits and deposits. Brazil's iron ore reserves amounted to 15,000,000,000 tons distributed as follows (taken from the periodical "Mining and Metallurgy", No 9, October 1937), in tons:

Compact haematite, 65 percent iron	1,500,000,000	10 percent
"Itabira", 50 to 60 percent iron	3,500,000,000	23.3 percent
Inferior ore, 30 to 50 percent	10,000,000,000	66.7 percent
Total	15,000,000,000	100 percent

"This estimate, which was made by the engineers of the Department of Ore Production, headed by the mining engineer Luciano Jacques de Moraes, is, according to these engineers, actually twice that amount. However, most of the remainder is iron ore of low iron content.

"Thus Brazil's reserves amount to 30,000,000,000 tons, of which compact haematite with an iron content amounting to an average of 65 percent, does not exceed 10 percent of the reserves, or not more than 3,000,000,000 tons.

Estimation based on studies and prospecting reserves

"The study of the iron mines, which, at present, is being carried out by the Vale do Rio Doce Company, Volta Redonda Company, and Belgo-Mineiro Ironworks Company, is already supplying us with very interesting data concerning not only the cubic quantity of each grade of ore, but also concerning their chemical and physical properties.

"The above is data collected by the Vale do Rio Doce Company, in its exploration of the Pico do Gaus mines, in Itabira, which encouraged this Company to begin a systematic study of drillings so as to obtain data concerning underground reserves. These studies were made to determine or confirm the physical characteristics and the chemical content of the various

grades of ore, and especially of compact haematite.

"Two enterprises contracted to carry out explorations which are being accompanied by Brazilian and US geologists.

"The data gathered both on the surface and under ground, in the Itabira deposits, either from the old galleries which were opened by the Itabira Iron Company or by the exploration of the open pit mines, has caused Brazil to anticipate that the quantities of ore with the necessary characteristics for the blast furnaces and also for sinterization are higher than that of the previous estimates which means, consequently, that the quantities of compact haematite, for the steel refinement in the Siemens-Martin blast furnace, are less than anticipated.

"Based on the cubic measurements made recently in the mines and on the observation of general conditions, the Superintendent of the Department of Mines is of the opinion that the reserves of ore of the company, with an iron content between 60 and 70 percent iron, total 1,000,000 tons and that of this tonnage 30 percent, or 300,000,000 tons is haematite with an average iron content of 67.5 percent;

"Of these 300,000,000 tons of haematite, part is constituted of compact haematite for refining in the Siemens-Martin steel blasting furnaces, and, is therefore exportable.

"Another part of that amount (less compact) is destined for the blast furnaces, for which an international market exists.

"The remainder, which consists of pulverized ore [called jacutinga] with a high iron content, is not at present exportable, due to its physical characteristics. It would have to be combined with other grades of ore.

"Of the other 70 percent of the Itabira ore reserves, one part consists

of ore for blasting furnaces such as "canga", which is exportable in its natural form and for which there is no international market. Another part consists of "itabirito" an easily crumbled ore (friable), siliceous, which can be exported after it is put into a concentrated form or sinterized.

By what is being revealed in the Itabira mines, and by what already can be observed in the Moaivade mines, in the Balgo-Mineira mines, in the Casa da Pedraminas mines, and in the National Ironworks mines, all of the exploration plans of the iron mines of the State of Minas will have to be alternated so that a large percentage of all of the grades of iron ore, which are not exportable, can be put to good use and not left as rejected.

It would not be conceivable that we exploit our iron mines so as to extract the compact hematite for exportation and leave the rest as rejected.

"It is from this new orientation to be given to the exploration services of our mines with the goal of putting to practical use all grades of ore that the new exportation policy for ore was derived, which is as follows:

"The exploitation of the iron ore beds, aimed at large scale exportation, will be organized on a practical basis so as to put to best all grades of ore. Those that, by their physical characteristics and by their high iron content, will find markets and will be exported in their natural state, those that possess these qualities and do not find markets will be used in national blasting furnaces or after sinterization, will be used in plants set up, preferably, near the mines, transformed in cast iron and exported in this form as a semi-finished product."

From another work of the same author, we have taken the following:

"We will have to export at low prices the compact hematite of high iron content which constitutes 30 percent of the total of our ore reserves. In addition we will have to sinterize and improve the remaining 70 percent, transforming it into cast iron, for large scale exportation or for meeting our own needs.

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"By what is being revealed in the Itabira mines, and by what already can be observed in the Monlevade mines, in the Balgo-Mineira mines, in the Casa da Pedraminas mines, and in the National Ironworks mines, all of the exploration plans of the iron mines of the State of Minas will have to be alternated so that a large percentage of all of the grades of iron ore, which are not exportable, can be put to good use and not left as rejected.

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"We will have to export at low prices the compact hematite of high iron content which constitutes 30 percent of the total of our ore reserves. In addition we will have to sinterize and improve the remaining 70 percent, transforming it into cast iron, for large scale exportation or for meeting our own needs.

"At present, the price of cast iron is approximately 6 times higher than that of ore, and it is easy to see it is best for Brazil that we export this 70 percent of ore, not in its natural state for it would not find a market as such, but in a "semi-improved" state, as cast iron."

Another Thesis in Vitoria

The President of the Vale do Rio Doce Company, in some public round table debates among technicians assembled by the Moraes Rago Center, composed the following slogan during a speech concerning return shipments:

"Ore for them, coal for us. "

"A region covered by extensive virgin forest, watered by mighty rivers with powerful water falls, which has very fertile land and possesses various vitia that are developing freely is located within the Belo Horizonte and Vitoria zone of influence.

"The Vitoria to Minas Railroad, which serves this region, is being modernized so as to offer rapid, efficient, and cheap transportation.

"In this valley, there is plenty of iron ore, coal and electric power potential.

"With the Itabira-Belo Horizonte union, the Vitoria to Minas Railroad will transport the limestone from the Sete Lagoas zone to the Vale Do Rio Doce.

"The ironworks and coal, are already in this valley . In the zone served by the E. F. Central do Brasil [Central Railroad of Brazil] there are the Morro Grande and Monlevade plants; in the zone of the Vitoria to Minas Railroad, in Vitoria, the plant of the Companhia de Ferro e Aco [Iron and Steel Company] is already in operation.

"If the Vitoria to Minas Railroad is going to transport 1,500,000 tons of ore, which comes from Itabira destined for the port of Vitoria for exportation, trains with empty cars on the 600 kilometer return trip will have to be formed.

"The ships that will receive this ore in the port of Vitoria will arrive there empty, because coal imports which could be made by these ships in their return voyage amount to practically nothing.

"If that is the situation, the Government and the private enterprises must turn their capital and their vision towards that valley and establish coal ironworks there.

"If we have ships that come back empty on their return trip and if we also have cars that return empty to the mines on their return trip, then we should use these empty ships and cars for transporting coal which is indispensable to the plants.

"In the US, iron ore reserves even with a low iron content, are already almost exhausted. The great US plants are very interested in our high iron content. As there is an abundance of coal in the US, it should be easy to establish reciprocal trade with these two raw materials. They need our ore, we need their coal, and that is the key to the economic solution for the creation of our iron depots.

"Why not try an agreement with the US, in the sense of participating in the great iron enterprises in the establishment of plants in the Vale do Rio Doce?

"If this agreement is carried out, it is certain that the Vale do Rio Doce will be one of the most industrialized zones of Brazil and her greatest iron center."

At this time, to these considerations, we can add the consideration that coal, thus distributed in the Vale do Rio Doce, would save our richest forest reserves in that region which are indispensable to the rain and fluvial waters, otherwise the land there would become devastated exhausted, scorched and useless.

In addition, the statements made by Deputy Duque de Macaúta as a member of the inter-parliamentary commission charged by Congress to study the economic and financial situation of the Vale do Rio Doce Company must also be considered. He stated:

"The solution of the C.V.R.D. [Vale do Rio Doce Company] problem lies in the importation of coal and coke accompanied by the exportation of ore.

"Concerning this, the following observations made by Valentin Boucas, who is unquestionably one of the best informed men on the subject of Brazil's trade with the US, stand out in one's mind:

"Brazil needs coal, a large quantity of which continues to be imported from the US. Special attention should be given to the fact that coal could be obtained by intermediary of the United States Steel Corporation, at a convenient purchase price. For the importation of coal, dollars are at present a difficult importation.

"The precise grades and quantities of coal to be imported should be fixed in detail.

"Coal can be paid for by iron ore after the respective unit values are established. A commercial product can be used in payment for another commercial product. The difference could be settled periodically."

All of these various opinions serve to show the importance of the situation.

From all that is in this report concerning the activities of the

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Vale do Rio Doce Company, it can be concluded that one of the two largest organization which are jointly owned by government and private interests already formed in Brazil is destined, like the other, the Companhia Siderurgica Nacional [National Ironworks Company] which is already in full development, to victoriously reach her high economic and patriotic goals.

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